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(54) ELECTROPHOTOGRAPHIC METHOD AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USED THEREFOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a photoreceptor which can enough electrified from the first rotation by incorporating a phthalocyanine compd. as a charge generating material and further incorporating an azo compd. into a photosensitive layer. SOLUTION: The photosensitive layer essentially consists of a charge generating layer and a charge transfer layer, and the charge generating material used is a phthalocyanine compd. For example, nonmetal phthalocyanines or phthalocyanines with coordination of copper, indium, tin, titanium, zinc, vanadium or oxides or chlorides of these can be used. Further, an azo compd. is used in the same layer that contains the phthalocyanine compd. As for the azo compd., monoazo, bisazo, trisazo, or polyazo, can be used. The compounding ratio of the phthalocyanine compd. to the azo compd. is 1:(0.1 to 2), and preferably 1:0.1 to 1. The ratio of a binder resin to these compd. (weight ratio) is specified to (0.2 to 5):1.

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CLAIMS

[Claim(s)]

[Claim 1] It is the electrophotography technique characterized by for this photo conductor having a sensitization layer on a conductive base material, for this sensitization layer containing a phthalocyanine compound as charge occurrence matter, and for this sensitization layer containing an azo compound further, and performing image formation from the one-revolution scale division of this photo conductor at least in the electrophotography technique of performing each process of electrification, exposure by the light of single wavelength, inversion development, and an imprint to a photo conductor.

[Claim 2] The electrophotography technique according to claim 1 characterized by carrying out image formation by light with a single wavelength of 600nm - 850nm.

[Claim 3] The electrophotography technique according to claim 1 characterized by carrying out image formation by light with a single wavelength of 660nm - 800nm.

[Claim 4] The electrophotography technique according to claim 1 characterized by for the aforementioned sensitization layer having a charge occurrence layer and a charge transportation layer, and this charge occurrence layer containing a phthalocyanine compound and an azo compound.

[Claim 5] The electrophotography photo conductor characterized by having the sensitization layer which is the electrophotography photo conductor used in the electrophotography technique characterized by performing each process of electrification, exposure by the light of single wavelength, inversion development, and an imprint to a photo conductor, and performing image formation from the one-revolution scale division of this photo conductor at least, and contains an azo compound further with the phthalocyanine compound as charge occurrence matter on a conductive base material.

[Claim 6] The electrophotography photo conductor according to claim 5 characterized by being used by light with a single wavelength of 600nm - 850nm in the electrophotography technique characterized by carrying out image formation.

[Claim 7] The electrophotography photo conductor according to claim 5 characterized by being used by light with a single wavelength of 660nm - 800nm in the electrophotography technique characterized by carrying out image formation.

[Claim 8] The electrophotography photo conductor according to claim 5 to 7 characterized by for a sensitization layer having a charge occurrence layer and a charge transportation layer, and for this charge occurrence layer reaching a phthalocyanine compound, and containing an azo compound.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the electrophotography photo conductor used for the electrophotography technique and this technique which are used for a copying machine, a printer, etc.

[0002]

[Description of the Prior Art] C. From a sex, a high quality, and the picture image with high shelf life being acquired instancy etc., in recent years, the electrophotographic technology by F. Carlsson's invention does not remain in the field of a copying machine, but the field of various printers or facsimile is also used widely and it has shown the big breadth. This electrophotography process consists of the image formation process by the imprint (it may go via the imprint field in the interval) and fixing to paper of formation of the electrostatic latent image by uniform electrification of a photo conductor and image exposure, the development by the toner of this latent image, and this toner image fundamentally.

[0003] About the photo conductor used as the nucleus of electrophotographic technology, as the photoconduction material, recently, it is pollution-free and the photo conductor which used the photoconduction material of the organic system which has the advantage of the grade with easy ease [membrane formation] and manufacture is developed from the photo conductor of an inorganic system called the selenium from the former, an arsenic-selenium alloy, a cadmium sulfide, and a zinc oxide. Since that a high sensitivity photo conductor is obtained, the thing acquired for the high photo conductor of safety with the wide selection domain of a material, and the productivity of an application are comparatively advantageous also in respect of a cost highly, the so-called laminating type photo conductor which carried out the laminating of inside or a charge occurrence layer, and the charge transportation layer has become in use [a photo conductor] now, and is produced in large quantities.

[0004] In order to memorize an input picture image in order to acquire a on the other hand recently more high definition picture image, or to edit freely, the digitization for image formation is advancing quickly. Although restricted to the LASER beam printer and LED printer which are the output equipment of a word processor or a personal computer, a part of color laser ***** etc. as what carries out image formation in digital until now, digitization is advancing rapidly also in the field of the ordinary copying machine whose analog--conventionally image formation was in use.

[0005] When performing such digital image formation, in using a computer information directly, after changing the electrical signal into a lightwave signal and reading a manuscript information as an optical information in the information input from a manuscript, it changes into a digital electrical signal at once, changes into a lightwave signal again, and is inputted into a photo conductor. Anyway, although inputted as a lightwave signal to a photo conductor, laser light and Light Emitting Diode light are mainly used for such an optical input of a digital signal. The dispatch wavelength of the input light present most often used is near-infrared light (780nm and 660nm) and the long wavelength light of the single wavelength near it. For the photo conductor used for digital image formation, being required in the first place first is having photographic sensitivity to such long wavelength light, and materials various until now are examined. Especially, the phthalocyanine compound is comparatively easy to compound, from there being much what shows photographic sensitivity to long wavelength light, it is examined broadly and practical use is presented with it.

[0006] For example, the photo conductor with which the photo conductor with which the photo conductor with which the photo conductor which used titanylphthalocyanine for JP,5-55860,B used beta type indium phthalocyanine for JP,59-155851,A used the x type non-metal phthalocyanine for JP,2-233769,A used the vanadyl phthalocyanine for JP,61-28557,A is indicated, respectively.

[0007] However, although the photo conductor using such a phthalocyanine compound as charge occurrence matter was a high sensitivity on long wavelength, it had the fault that the band voltage of one-revolution scale division was low, and a band voltage was stabilized at last from 2 rotation scale division. This phenomenon is related to the neglect time after the image formation process of electrification and exposure, and the inclination that the band voltage of one-revolution scale division is [the one where neglect time is as long as 30 minutes, 1 etc. hour, etc.] low is seen. From this, it is considered by this phenomenon for the phenomenon of a charge being poured in in a charge occurrence layer and accumulating from occurrence of the dark charge by the phthalocyanine compound under neglect, a store into the charge occurrence layer, or a conductive base material to be related.

[0008] On the other hand, in performing image formation in digital, it adopts the so-called inversion development method which a toner is made to adhere to the fraction which irradiated light, and forms a picture image from the purpose which raises the deployment or resolution of light in many cases. In an inversion development process, the unexposed section (dark-space

potential) serves as a white ground, and the exposure section (bright section potential) turns into the black material section (streak section). Therefore, in an inversion development process, although a fogging (phenomenon which a sunspot produces among the white section) does not occur even if bright section potential rises like a regular development process, if dark-space potential falls, a fogging will occur. Therefore, a scorotron charger is used in many cases as an electrification machine so that dark-space potential may always be kept constant.

[0009]

[Problem(s) to be Solved by the Invention] Conventionally, since the electrophotography equipment using the inversion development technique using the photo conductor using the phthalocyanine compound as charge occurrence matter had the fault of being easy to fog the band voltage of one-revolution scale division low as mentioned above, the pre-rotation more than one revolution was surely put in as a warming up. It means that this needs much time after electrophotography equipment begins a drive before actual image formation is performed. But conventionally, moreover the data transfer from a computer to a printer was late, also in a digital copying machine, time has the factor of such a grade in an image processing, and the time which pre-rotation takes did not become especially a problem.

[0010] However, the enhancement in a performance of a microcomputer was remarkable in recent years, since a data transfer time and image-processing time were becoming sufficiently quick, it uses for image formation from the one-revolution scale division of a photo conductor, and the demand of wanting to make the first copy and a print quick came out. However, when it was used in the process which uses the photo conductor using the conventional phthalocyanine as charge occurrence matter for image formation from one-revolution scale division, as mentioned above, it turns out that concentration change must be caused since the band voltage of one-revolution scale division is low, or it cannot but fog when severe, and pre-rotation surely must be put in. This means that a print does not become quick in the first copy. Moreover, although the photo conductor using an azo system compound which is shown in JP,57-196244,A could show electrification nature comparatively better than one-revolution scale division and the image formation process could be performed from one-revolution scale division, since photographic sensitivity was low, it could not accelerate, but the first copy had too the fault of not becoming quick. a publication-number 37667 [three to] official report -- the charge occurrence matter ***** -- a titanium phthalocyanine and an azo compound -- containing -- a pan -- although the technique of manufacturing a chromatic photo conductor is indicated, in the image formation by the light of single wavelength, a titanium phthalocyanine is used as charge occurrence matter, and it is not indicated by by using an azo compound together like this invention that image formation which was excellent from 1 rotation scale division can be performed

[0011]

[Means for Solving the Problem] This invention persons had high photographic sensitivity in long wavelength light, by examining a photo conductor which is fully charged from one-revolution scale division, could perform image formation from the one-revolution scale division of a photo conductor, and examined the quick electrophotography technique of the first copy and a print. Consequently, in order to contain a phthalocyanine as charge occurrence matter in order to have sufficiently high photographic sensitivity in long wavelength light, and to be enough charged from one-revolution scale division, using an azo compound further found out the desirable thing, and it resulted in invention of this electrophotography technique.

[0012] That is, in the electrophotography technique that the summary of this invention performs each process of electrification, exposure by the light of single wavelength, inversion development, and an imprint to a photo conductor at least, this photo conductor has a sensitization layer on a conductive base material, a phthalocyanine compound is contained as charge occurrence matter, a sensitization layer contains an azo compound further, and this sensitization layer is in the electrophotography technique characterized by performing image formation from the one-revolution scale division of this photo conductor. Moreover, in the aforementioned electrophotography technique, the aforementioned sensitization layer has a charge occurrence layer and a charge transportation layer, and the summary of this invention is in the electrophotography technique characterized by this charge occurrence layer containing a phthalocyanine compound and an azo compound.

[0013]

[Embodiments of the Invention] Hereafter, this invention is explained in detail. In this invention, a sensitization layer is prepared on a conductive base material. As a conductive base material, a polyester film, the paper, etc. which deposited metallic materials and aluminum, such as aluminum, an aluminium alloy, stainless steel, copper, and nickel, for example are mainly used.

[0014] Between such a conductive base material and the sensitization layer, a well-known barrier layer which is usually used may be prepared. As a barrier layer, organic layers, such as inorganic layers, such as an aluminum anodized coating, an aluminum oxide, and an aluminum hydroxide, polyvinyl alcohol, casein, a polyvinyl pyrrolidone, a polyacrylic acid, celluloses, gelatin, starch, polyurethane, a polyimide, and a polyamide, are used, for example. Moreover, conductivity, such as metals, such as aluminum, copper, tin, zinc, and titanium, or a metallic oxide, or the half-conductivity particle may be included in these barrier layers.

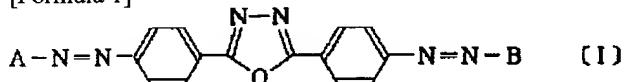
[0015] Although the sensitization layer of this invention has the desirable laminating type which consists of a charge occurrence layer and a charge transportation layer fundamentally, the so-called monolayer distributed type which consists of a single sensitization layer is sufficient. Hereafter, a laminating type is mainly explained. A phthalocyanine compound is used as charge occurrence matter. Specifically, the phthalocyanines which metals, such as a non-metal phthalocyanine, copper, an indium, a gallium, tin, titanium, zinc, and vanadium, or the oxide of those, and the chloride configurated are used. Titanylphthalocyanine, such as an X type with especially high photographic sensitivity, a tau type non-metal phthalocyanine, A type, B type, and D type, the vanadyl phthalocyanine, the ***** indium phthalocyanine, etc. are suitable.

[0016] It is desirable to use an azo compound into the same layer as a phthalocyanine compound in this invention. As an azo

compound, azo compounds, such as monoazo, screw azo, tris azo, and polyazo, can be used. It is more desirable for the quantity of light absorbed by the phthalocyanine to decrease, to imitate a fall of photographic sensitivity, and not to have absorption for a ** reason, although these azo compounds may have absorption in the laser light and Light Emitting Diode light which are used for exposure. As a desirable azo compound, the compound shown by the following formula [I] is mentioned especially.

[0017]

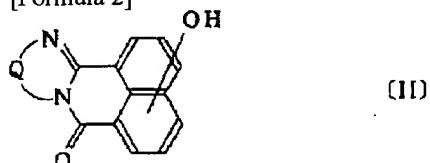
[Formula 1]



[0018] (A and B show the coupler residue which has a phenolic hydroxyl group, respectively.) As a desirable example of the coupler residue of A and B, they are a formula [II] or [III].

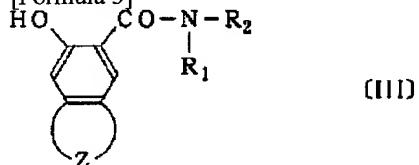
[0019]

[Formula 2]



[0020]

[Formula 3]



[0021] *****. The divalent base of the aromatic hydrocarbon in which Q may have the substituent in the formula [II], Or the divalent base of the heterocycle which may have the substituent is shown. For example, O-phenylene group, O-naphthylene machine, 1, 8-naphthylene machine, 1, 2-antra kino ***** machine, 9, 10-phenan tolylene machine, 3, 4-pyrazole diyl machine, 2, 3-pyridine diyl machine, 3, 4-pyridine diyl machine, 4, 5-pyrimidine diyl machine, 6, 7-indazole diyl machine, 5, 6-benzimidazole diyl machine, 5, and 6-quinoline diyl machine etc. is mentioned.

[0022] In a formula [III], it is R1. And R2 The low-grade alkyl group, the aryl group, or heterocycle machine which may have the hydrogen atom and the substituent is shown, respectively, and it is R1. R2 It may join together mutually and the ring may be formed. The base which Z condenses with the benzene ring, and shows the divalent base taken to become an aromatic-hydrocarbon ring or a heterocycle, for example, condenses with the benzene ring, and serves as a naphthalene ring, an anthracene ring, a carbazole ring, a benzo carbazole ring, and a dibenzofuran ring is mentioned.

[0023] A charge occurrence layer may use the particle (it is 0.3 micrometers or less still preferably 0.5 micrometers or less more preferably [it is desirable and] than 1 micrometer or less of mean particle diameters) of these phthalocyanine compounds and an azo compound by the dispersion layer of the type bound with various binder resins, such as polyester resin, a polyvinyl acetate, polyacrylic ester, a polycarbonate, a polyvinyl aceto acetal, polyvinyl propional, a polyvinyl butyral, a phenoxy resin, an epoxy resin, a urethane resin, a cellulose ester, and a cellulose ether.

[0024] The proportion (weight ratio) of a phthalocyanine compound and an azo compound is preferably used by 0.1-2 to a phthalocyanine 1, and is used by the proportion of 0.1-1 still preferably. Moreover, the proportion (weight ratio) of the binder resin to these compounds is used in 0.2-5 to these compounds 1. 0.1-2-micrometer 0.1-0.8 micrometers are usually preferably suitable for the thickness. Moreover, various additives, such as a leveling agent for improving application nature, and an antioxidant, a sensitizer, may be included in the charge occurrence layer if needed.

[0025] a charge transportation layer -- mainly -- a charge transportation material and a binder resin **** -- becoming -- a charge transportation material ***** -- 2, 4, and 7-trinitro full -- me -- non, electron-donative matter, such as a polymer which has the base which consists of heterocyclic compounds, such as electronic suction nature matter, such as a tetracyano quinodimethan, a carbazole, Indore, an imidazole, an oxazole, a pyrazole, a ***** diazole, a pyrazoline, and thiadiazole, an aniline derivative, a hydrazone compound, an aromatic-amine derivative A charge transportation layer is formed in the type which these charge transportation materials bound to the binder resin.

[0026] as a binder resin used for a charge transportation layer, the vinyl-polymerization fields, such as a polymethylmethacrylate, polystyrene, and a polyvinyl chloride, and the copolymer of those, a polycarbonate, polyester, polyester carbonate, a polysulfone, a polyimide, a phenoxy, epoxy, silicone resin, etc. raise, for example -- having -- moreover -- these -- partial -- bridge formation -- a hardened material can also be used

[0027] the rate of a binder resin and the charge transportation matter -- usually -- the binder resin 100 weight section -- receiving -- 30 - 200 weight section -- it is preferably used in the domain of 40 - 150 weight section Moreover, generally 5-50-micrometer

10-45 micrometers of a thickness are preferably good. In addition, membrane formation nature and in order to raise ****, application nature, etc. as it is good, you may make a charge transportation layer contain additives, such as a well-known plasticizer, an antioxidant, an ultraviolet ray absorbent, and a leveling agent.

[0028] These sensitization layers are formed of a dip-painting cloth, a spray application, a nozzle application, etc. on a conductive base. Preferably, photographic sensitivity is high in 660nm - 800nm light, and wavelength [the single wavelength of long wavelength], for example, since it is enough charged from one-revolution scale division, by using this photo conductor, the photo conductor obtained as mentioned above can constitute the electrophotography process which performs image formation from one-revolution scale division of a photo conductor, and can constitute 600nm - 850nm of the first copies or the quick electrophotography equipments of a print.

[0029] Although this electrophotography technique includes each process of electrification, exposure, inversion development, and an imprint at least, you may use any of the technique by which every process is usually used. As the electrification technique, contact electrification by the corotron which used corona discharge, for example or scorotron electrification, the conductive roller, or the brush etc. may use any. By the electrification technique using corona discharge, in order to keep dark-space potential constant, scorotron electrification is used in many cases. Although a contact or the general technique of making carry out non-contact and developing is used in a magnetic or nonmagnetic 1 component developer, a two component developer, etc. as the development technique, it is used in the inversion development whose all develop bright section potential. As the imprint technique, any are sufficient as the technique using the thing and imprint roller which are twisted to corona discharge etc. Usually, heat fixing and the pressure fixing which the fixing process which fixes a developer to paper etc. is used, and are generally used as a fixing means can be used. You may have the processes other than these processes, such as cleaning and electric discharge.

[0030] In this electrophotography technique, although image formation is performed from the one-revolution scale division of a photo conductor, the photo conductor used in this electrophotography technique is useful also in the process to which image formation is carried out from the 2 rotation scale division of a photo conductor or subsequent ones. That is, in the photo conductor which contains a phthalocyanine as conventional charge occurrence matter, there was a case where the image formation to which development will be carried out in spite of not performing image formation if it uses in inversion development since the band voltage of one-revolution scale division is too low, and it is carried out after 2 rotation scale division was affected. In the photo conductor used for this electrophotography technique, since it is enough charged from one-revolution scale division, such a phenomenon is avoidable. [0031]

[Example] Below, although this invention is explained concretely, this invention is not limited to the following examples by the example, unless the summary is exceeded.

60 degrees C and 5 minute indirect-desulfurization fat washing were performed for the aluminum cylinder with the outer diameter of 65mm which carried out the example 1 cutting, a length [of 348mm], and a thickness of 1mm in 30g [l.] aqueous solution of degreaser NG-#30 (product made from *****). Then, after rinsing, it flooded with the nitric acid for 1 minute at 25 degrees C 7%.

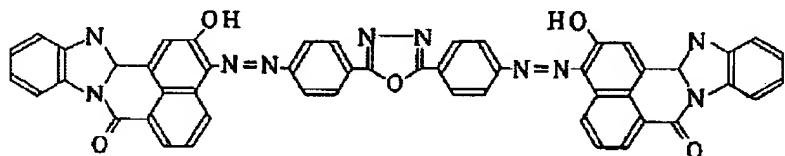
[0032] Furthermore, it is 1.2A/dm² after rinsing and in the 180g [l.] sulfuric-acid electrolytic solution (dissolved-aluminum-in-electrolytic-solution concentration of 7g/l.). Anodic oxidation was performed with current density and the anodized coating of 6 micrometers of mean thickness was formed. subsequently, the elevated-temperature sealing agent which makes the nickel acetate after rinsing a principal component -- it was immersed in 10g [l.] aqueous solution of top seal DX-500 (product made from Okuno Medicine manufacture Industry) for 30 minutes at 95 degrees C, and the sealing was performed Then, after rinsing, it washed by making the whole coat surface go 3 times, and rubbing it using the sponge made from polyester. Subsequently, it rinsed and dried.

[0033] It is a 4-methoxy-4-methyl pentanone about the oxy-titanium phthalocyanine 10 weight section of crystal system which shows a diffraction peak to the maximum diffraction peak and 7.4 degrees, 9.7 degrees, and 24.2 degrees in a powder X-ray diffraction spectrum on the other hand at 27.3 degrees (2theta**0.2 degree) of Bragg angles, and the azo compound (azo -1) 5 weight section which has the following structure. - 2 In addition to 200 weight section, trituration distributed processing was performed in ***** line *****.

[0034]

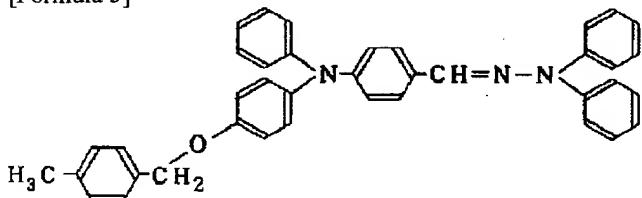
[Formula 4]

アソ-1



[0035] Moreover, the 4% of 4% of polyvinyl butyral (Sekisui Chemical Co., Ltd. make, tradename id ***** BH-3) and 2-dimethoxyethane solution 100 weight section and phenoxy resin (made in [Union Carbide], tradename PKHH) and 2-dimethoxyethane solution 100 weight section was mixed, and the binder solution was produced. The binder solution 375 weight section, 1, and 2-dimethoxyethane 160 weight section was added to the pigment variance liquid 215 weight section produced previously, and, finally distributed liquid of 4.0% of solid-content concentration was produced. The dip-painting cloth of the aluminum cylinder which prepared the anodized coating formed previously was carried out to this distributed liquid, and the

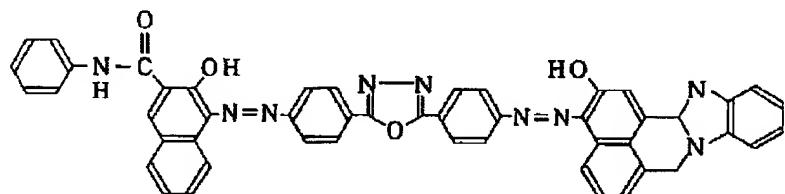
charge occurrence layer was formed so that the thickness after xeransis might be set to 0.5 micrometers. Next, the hydrazone compound 70 weight section which shows this aluminum cylinder below [0036]
[Formula 5]



[0037] And the dip-painting cloth was carried out to the liquid made to melt the polycarbonate resin (Mitsubishi Chemical make, nova ***** 7030A) 100 weight section in the 1 and 4-dioxane 1000 weight section, and the charge transportation layer was prepared so that the thickness after xeransis might be set to 25 micrometers. Thus, the obtained drum is set to photo conductor A. As example 2 azo compound, the compound (azo -2) which has the following structure was used, and also photo conductor B was produced like the example 1.

[0038]

[Formula 6]
アゾ-2



[0039] It is a 4-methoxy-4-methyl pentanone about the same oxy-titanium phthalocyanine 15 weight section as having used in the example of comparison 1 example 1. - 2 In addition to 200 weight section, trituration distributed processing was performed in ***** line *****. On the other hand, the 4% of 4% of polyvinyl butyral (Sekisui Chemical Co., Ltd. make, tradename id ***** BH-3) and 2-dimethoxyethane solution 100 weight section and phenoxy resin (made in [Union Carbide], tradename PKHH) and 2-dimethoxyethane solution 100 weight section was mixed, and the binder solution was produced.

[0040] The binder solution 375 weight section, 1, and 2-dimethoxyethane 160 weight section was added to the pigment variance liquid 215 weight section produced previously, and, finally distributed liquid of 4.0% of solid-content concentration was produced. Photo conductor C was created like the example 1 except having carried out the dip-painting cloth of the aluminum cylinder which carried out the anodizing to the distributed liquid obtained here, and having formed the 0.5-micrometer charge occurrence layer.

[0041] It is a 4-methoxy-4-methyl pentanone about the same oxy-titanium phthalocyanine 10 weight section as having used in the example of comparison 2 example 1. - 2 In addition to 200 weight section, trituration distributed processing was performed in ***** line *****. On the other hand, the 4% of 4% of polyvinyl butyral (Sekisui Chemical Co., Ltd. make, tradename id ***** BH-3) and 2-dimethoxyethane solution 100 weight section and phenoxy resin (made in [Union Carbide], tradename PKHH) and 2-dimethoxyethane solution 100 weight section was mixed, and the binder solution was produced.

[0042] The binder solution 500 weight section, 1, and 2-dimethoxyethane 40 weight section was added to the pigment variance liquid 210 weight section produced previously, and, finally distributed liquid of 4.0% of solid-content concentration was produced. Photo conductor D was obtained like the example 1 except having carried out the dip-painting cloth of the aluminum cylinder which carried out the anodizing to the distributed liquid obtained here, and having formed the 0.5-micrometer charge occurrence layer.

[0043] The process speed which converted these photo conductors A, B, C, and D into inversion development and at which a copy process is performed from the one-revolution scale division of a photo conductor equipped the copying machine of 190mm/sec, attached the photo conductor surface potential measuring device, and repeated the process of only electrification, exposure, and electric discharge 50000 copy process (it is an equivalent for a 50,000 sheet copy at A4 crossfeed). Switching on the power of a copying machine, in order not to make warming-up operations (rotation before a photo conductor which precedes image formation) perform, after 1 hour neglect, pushed the copy button, the copy process was made to perform, and the surface potential of the unexposed section of the photo conductor at this time was measured. This result is shown in Table 1.

[0044]

[Table 1]

表1 50000コピープロセスの後、1時間放置
後の最初の一回転目及び二回転目の表面電位

感光体	1回転目の未露光部 表面電位 (-V)	2回転目の未露光部 表面電位 (-V)
A	630	650
B	610	645
C	570	650
D	565	655

[0045] Next, it was left for 1 hour, turning on power, after taking a photograph of 1000 sheets of these photo conductors on the spot with the copying machine converted into previous inversion development, and the manuscript which had the black material section and the halftone section 1 hour after was copied (since it is inversion development, the black material section of a manuscript serves as a white ground by the copy). Consequently, in photo conductor A, although the picture image with good white section and halftone section was acquired and concentration change was seen in the middle of the halftone section in photo conductor B, the white section was good. On the other hand, in photo conductors C and D, the fogging was seen in the first half of the white section, and a clear concentration change was seen by the halftone section.

[0046]

[Effect of the Invention] As mentioned above, when a sensitization layer contains a phthalocyanine compound as charge occurrence matter according to this invention, photographic sensitivity is high on long wavelength, the photo conductor enough charged from one-revolution scale division when a sensitization layer contains an azo compound further is obtained, the electrophotography process which performs image formation from the one-revolution scale division of a photo conductor by using this photo conductor can be constituted, and the first copy or the quick electrophotography equipment of a print can be constituted.

[Translation done.]